CLAIMS:

1 1. A method of automatically determining the distance between a
2 first RF equipped device and a second RF equipped device
3 comprising:
4   establishing a radio link between said first RF equipped
5 device and said second RF equipped device;
6   in said first RF equipped device:
7   creating an acoustic waveform in the form of first
8   digital audio samples;
9   transmitting said first digital audio samples via said
10   radio link;
11   converting said first digital audio samples to an analog
12   audio waveform;
13   emitting said analog audio waveform as an acoustic signal
14   via a loudspeaker;
15   in said second RF equipped device:
16   receiving said first digital audio samples via said radio
17   link;
18   receiving said acoustic signal via a microphone;
19   converting said received acoustic signal to second
20   digital audio samples; and
21   determining the time difference between the arrival of
22   said first digital audio samples and said acoustic signal; and
23   determining the distance between said first RF equipped
24   device and said second RF equipped device based on the known
25   speed of propagation of radio waves, the known speed of sound,
26   and the time difference between the arrival of said first
27   digital audio samples and said acoustic signal.
1

1 2. The method of claim 1 further comprising comparing said first
2 digital audio samples against said second digital audio samples to
3 determine if they match, and if said first digital audio samples
4 match said second digital audio samples, then performing said

5   determining the time difference between the arrival of said first

6   digital audio samples and said acoustic signal.

1

1   3.   The method of claim 1 wherein said radio link is Bluetooth™.

1

1   4.   The method of claim 1 further comprising terminating an

2   exchange of further radio messages between said first and second RF

3   equipped devices if the distance determined is greater than a

4   threshold value.

1

1   5.   The method of claim 1 further comprising terminating the

2   performance of a financial transaction if the distance determined

3   is greater than a threshold value.

6. In an RF equipped device, a method of automatically determining

the distance between said RF equipped device and a second RF

equipped device, said second RF equipped device capable of emitting

an acoustic signal and transmitting a radio signal, said method

comprising:

        receiving first digital audio samples via a radio link;

        receiving an acoustic signal via a microphone;

        converting said received acoustic signal to second digital

9   audio samples; and

10   determining the time difference between the arrival of said

11   first digital audio samples and said acoustic signal; and

12   determining the distance from said second RF equipped device

13   based on the known speed of propagation of radio waves, the known

14   speed of sound, and the time difference between the arrival of said

15   first digital audio samples and said acoustic signal.

1

1   7.   The method of claim 6 further comprising comparing said first

2   digital audio samples against said second digital audio samples to

3   determine if they match, and if said first digital audio samples

4 match said second digital audio samples, then performing said

5 determining the time difference between the arrival of said first

6 digital audio samples and said acoustic signal.

1

1 8.   The method of claim 6 wherein said radio link is Bluetooth™.

1

1 9. An RF equipped device capable of automatically determining the

2 distance between itself and a second RF equipped device wherein

3 said second RF equipped device emits an acoustic signal and

4 transmits a corresponding radio signal, said RF equipped device

5 comprising:

6   an RF module that receives first digital audio samples via a

7 radio link;

8   a microphone that receives an acoustic signal;

9   a CODEC that converts said received acoustic signal to second

10 digital audio samples; and

11   a processor that:

12   determines the time difference between the arrival of said

13 first digital audio samples and said acoustic signal; and

14   determines the distance from said second RF equipped device

15 based on the known speed of propagation of radio waves, the known

16 speed of sound, and the time difference between the arrival of said

17 first digital audio samples and said acoustic signal.

1

1 10. The RF equipped device of claim 9 wherein said processor

2 further compares said first digital audio samples against said

3 second digital audio samples to determine if they match.

1

1 11. The RF equipped device of claim 9 wherein said radio link is

2 Bluetooth™.

1

1 12. In an RF equipped device, a computer program product that

2 automatically determines the distance between itself and a second

3 RF equipped device, said second RF equipped device capable of

4 emitting an acoustic signal and transmitting a radio signal, the

5 computer program product having a medium with a computer program

6 embodied thereon, the computer program product comprising:

7   computer program code for receiving first digital audio

8 samples via a radio link;

9   computer program code for receiving an acoustic signal via a

10 microphone;

11   computer program code for converting said received acoustic

12 signal to second digital audio samples; and

13   computer program code for determining the time difference

14 between the arrival of said first digital audio samples and said

15 acoustic signal; and

16   computer program code for determining the distance from said

17 second RF equipped device based on the known speed of propagation

18 of radio waves, the known speed of sound, and the time difference

19 between the arrival of said first digital audio samples and said

20 acoustic signal.

1 13. The computer program product of claim 12 further comprising

2 computer program code for comparing said first digital audio

3 samples against said second digital audio samples to determine if

4 they match, and if said first digital audio samples match said

5 second digital audio samples, then determining the time difference

6 between the arrival of said first digital audio samples and said

7 acoustic signal.

1

1 14. The computer program product of claim 12 wherein said radio

2 link is Bluetooth™.

3